NewsRelease

National Aeronautics and
Space Administration

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For Release: September 30, 2004

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RELEASE: 04-063

NASA TECHNOLOGY MEANS NO MORE FLYING BLIND

Imagine a world where pilots see clear skies all the time. It's not some weather fantasyland, but a revolutionary cockpit display technology called Synthetic Vision. NASA is developing it to make flying safer.

NASA aeronautics researchers at Langley Research Center in Hampton, Va., tested this Synthetic Vision Systems technology on a Gulfstream GV business jet this summer in the skies over Reno, Nevada and over the NASA Wallops Flight Facility, Wallops Island, Va.

The system gives a pilot a clear electronic 3-dimensional perspective of what's outside, no matter what the weather or time of day. It combines Global Positioning System satellite signals with an on-board photo-realistic database to paint a picture of terrain for the crew.

During the flight tests, NASA evaluated an integrated version of the technology. It included a birds' eye view of topography, a voice-recognition system, advanced sensors and Database Integrity Monitoring Equipment that insures accuracy by using sensors to compare the real world to the pictures being generated. Added to this was a Runway Incursion Prevention System, which includes an airport moving map and software that predicts possible encroaching runway traffic and alerts the crew.

NASA will use the results of the flight test to advance the development of technology to help reduce the fatal aircraft accident rate under its NASA Aviation Safety and Security Program. Synthetic Vision Systems could help eliminate the world's deadliest aviation accidents, called Controlled Flight into Terrain (CFIT). A CFIT accident is where a normally functioning aircraft slams into the ground, water or an obstacle, either because the pilot wasn't aware the plane was headed in the wrong direction, or due to bad weather or a combination of factors.

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"NASA has already tested the individual technologies of Synthetic Vision and Runway Incursion Prevention Systems on board a NASA 757 aircraft," said Randy Bailey, Synthetic Vision principle investigator. "We were excited to see it fly as an integrated system on the Gulfstream. We were particularly excited to be partnered with Gulfstream which has been an industry innovator in aviation technology."

Other flight test partners include the U.S. Air Force Research Laboratory, Wright-Patterson AFB; Rockwell Collins, Cedar Rapids, Iowa; Jeppesen, Englewood, Colo.; Rannoch Corp., Alexandria, Va.; The Boeing Company, Huntington Beach, Calif.; RTI International, Research Triangle Park, N.C.; and Ohio University, Athens, Ohio.

Seventeen pilots selected from the Federal Aviation Administration, the Air Force, the Joint Aviation Authority, the aerospace industry and major airlines flew the GV over 67 hours in 22 flights to collect data. A Gulfstream pilot was pilot-in-command.

During the flight evaluations, the test pilots' windshield was often intentionally covered or flights were conducted at night. The process simulated low visibility conditions, so the pilot would have to rely on the computer-generated information on the displays. The information was shown on head-down displays mounted into the plane's instrument panel as well as a head-up display that superimposes terrain and guidance information onto a screen located in front of the pilot's eyes.

A number of airline pilots have already flown components of the Synthetic Vision System in simulators and a NASA 757 research jet. "I think it's awesome." said United Airlines 767 Captain Rick Shay of the technology. "To explain the difference in the situational awareness that you gain, it's just a complete leap from the technology that's there today."

The NASA Aviation Safety and Security Program is part of NASA's Aeronautics Research Mission Directorate. It is also a partnership with the Federal Aviation Administration, aircraft manufacturers, airlines and the Department of Homeland Security. The program's goal is to reduce the fatal aircraft accident rate and protect air travelers and the public from security threats.

For more on the NASA Aviation Safety and Security Program on the Web please visit:

http://avsp.larc.nasa.gov

For more information about the programs of NASA's Aeronautics Research Mission Directorate, visit

http://www.aeronautics.nasa.gov

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